

North American Species of the Genus *Eupteryx* (Homoptera: Cicadellidae)

PAUL J. CHRISTIAN

Department of Biology, University of Louisville,
Louisville, Kentucky

INTRODUCTION

THE LEAFHOPPER genus *Eupteryx* Curtis, as defined and restricted by Young (1952), is a genus which is primarily if not entirely holarctic in distribution with most of the species occurring in the palearctic region. The North American species which are not known to occur in Europe all belong to the Furcata Group of Young (1952). Single introduced species of the Aurata, Artemisiae, and Melissae Groups of Ribaut (1936) also occur in North America.

The first North American species of *Eupteryx* were recognized and described by Gillette (1898) as *E. vanduzeei* and *E. flavoscuta*. The third species recognized was described by Osborn (1905) and named *E. nigra*. Van Duzee (1917) regarded *Eupteryx* as a synonym of *Typhlocyba* and placed these species in *Typhlocyba*. He also recorded the occurrence of *Eupteryx collina* Flor in North America. McAtee (1919) returned these species to *Eupteryx*, and redescribed *E. melissae* Curtis giving *Typhlocyba stachydearum* Hardy, *T. collina* Flor, and *Eupteryx quinquemaculata* Baker as synonyms of it. He also regarded *E. nigra* Osborn as a variety of *flavoscuta* Gillette and described *E. juvenis* and *clavalis* as new varieties of *flavoscuta*. Dr. McAtee next (1925) recorded *E. artemisiae* as occurring in North America. Osborn (1928) asserted that *nigra* was distinctly a species and not a variety of *flavoscuta* as McAtee had regarded it. Johnson (1935) supported Dr. Osborn's assertion with characteristics of the male pygofer hook, but she continued to regard *clavalis* as a variety of *flavoscuta*. Next Beamer (1943) described *furcata* as a species of *Typhlocyba*. Oman (1949) placed all the species of *Eupteryx* in the genus *Cicadella* and regarded *clavalis* and *juvenis* as species, rather than varieties of *flavoscuta*. Young (1952) reestablished the validity of the use of *Eupteryx*, returned the species to *Eupteryx* and placed *furcata* in the genus for the first time.

In the present work the author redescribes all of the previously

known species which occur in North America giving illustrations of the male genital characteristics, describes one new species (*Eupteryx omani*) from Florida, identifies *Eupteryx juvenis* as a teneral form of *E. nigra*, and identifies and describes the male form of *E. vanduzeei* previously not known.

KEY TO THE NORTH AMERICAN SPECIES OF *Eupteryx*

1. With sharply distinct black or brown spots on crown of head. . . 2
Without sharply distinct black or brown spots on crown of head 3
2. With five distinct spots on head; pronotum with four to six small brown to black spots. Male genitalia as in Fig. 7. *mcclissae* p. 50
With only three distinct spots on head; pronotum with three dark markings. Male genitalia as in Fig. 8. *aurata* p. 52
3. Head uniform yellowish green; fore-wings yellowish green with traces of light brown color among veins. *artemisiae* p. 53
Head bright yellow or yellow with varying amounts of brown or black color. 4
4. Lower half of face and venter of thorax brown; dorsum entirely black or black with varying amounts of white on fore-wing. Male genitalia as in Fig. 6. *vanduzeei* p. 48
Lower half of face and venter of thorax yellow; fore wings with yellow band along costal margin on basal half. 5
5. Scutellum uniformly deep blackish brown. 6
Scutellum yellow with basal angles brown. 7
6. Length 3.0-3.25 mm. Male genitalia as in Fig. 5. *omani* p. 48
Length 3.75-4.0 mm. Male genitalia as in Fig. 4. *nigra* p. 46
7. Male pygofer hooks about equal in length, Fig. 1A; from Western North America. *furcata* p. 43
Male pygofer with hooks unequal in length. Figs. 2A, 3A; from Eastern North America. 8
8. Posterior margin of male pygofer greatly attenuated, with posterior hook longer than medial hook. Fig. 3A. *flavoscuta* p. 45
Posterior margin of male pygofer truncated, with posterior hook shorter than medial hook. Fig. 2A. *clavalis* p. 44

Eupteryx furcata (Beamer)

(Fig. 1 A, B, C.)

Typhlocyba furcata Beamer, 1943, Canadian Ent., 75: 133.

Eupteryx, furcata, Young, 1952, Bull. Univ. Kansas Sci. Bull., 35 (I, 1) : 96.

Resembling *Eupteryx clavalis* McAtee in color pattern but color much lighter brown, and with pygofer more elongate with medial hook directed dorsocaudad; known to occur only in Western North America.

Length.—3.5-3.75 mm.

Color.—Head: vertex and crown yellow to yellow-orange usually unmarked but rarely with a pair of dusky spots near vertex; face yellow. Thorax: yellow beneath; pronotum yellow with a pair of irregular light-brown lines each extending from the anterior margin behind eye to lateral margin; scutellum yellow with dark markings in basal angles on heavily marked specimens. Wings: clavus and border along costal margin almost to distal angle of fourth apical cell yellow to yellow-orange; apex and basal third of clavus along claval suture light brown; costal area nearly divided by a brown mark near middle of wing; area between costal area and claval suture light brown on basal half fumose hyaline on apical half to cross veins; first, basal half of second, and most of fourth apical cells fumose hyaline; outer half of second, all of third, and distal angle of fourth apical cells fumose to light brown, brown markings appearing as an irregular longitudinal stripe extending from behind eye to apex of fore wing, and as a less distinct transverse band at apex of clavus. Abdomen yellow.

Male genitalia.—Male pygofer: posterior margin produced dorsocaudad in a bluntly-rounded lobe; both pygofer hooks of nearly equal length, directed dorsocaudad; dorsal portion of lobe membranous, nearly transparent. Aedeagus in lateral aspect with posterior margin nearly straight on apical half of shaft, strongly constricted near point of attachment of dorsal apodeme. Single pair of slender apical processes crossed near base, half as long as shaft. Style: strongly curving lateroventrad, with typical preapical tooth on mesal margin. Connective: somewhat triangular with posterior angle broadly truncate; aedeagal attachment subapical.

Material studied: Holotype male; allotype female; one male and three female paratypes; Stinson Beach, California, Aug. 15, 1938, R. H. Beamer. Three female paratypes, Monterey, California, July 22, 1935, R. H. Beamer. Sixty-seven females and five males, McMinnville, Oregon, August 1946, K. M. Fender. Additional Oregon specimens, in alcohol, which appear to be *furcata* have also been seen.

Eupteryx clavalis McAtee

(Fig. 2 A, B, C.)

Eupteryx flavoscuta var. *clavalis* McAtee, 1919, Ent. News, 30: (7) 185.

Eupteryx clavalis, Johnson, 1935, Ohio State Univ. Bull., 39 (29): 49.

Cicadella clavalis, Oman, 1949, Mem. Ent. Soc. Washington, 3: 89.

Eupteryx clavalis, Young, 1952, Bull. Univ. Kansas Sci. Bull., 35 (I, 1): 96.

Resembling *Eupteryx furcata* Beamer in color pattern but with brown color more intense and extensive, with male pygofer differing in

having mesal hook longer than apical hook and in having posterior lobe nearly as long as broad. Known to occur only in Eastern North America.

Length.—3.5-3.75 mm.

Color.—Head: face and vertex yellow; crown usually light brown between eyes to posterior margin, sometimes also yellow. Thorax: yellow beneath; pronotum yellow with light brown markings along anterior margin and on lateral thirds, sometimes more extensive; scutellum yellow with basal angles light brown. Fore wing: yellow with an irregular light brown longitudinal stripe covering basal fourth and apical third of clavus, all of inner two basal cells, along inner third of third basal cell, and all of second and third apical cells and outer third of first and fourth apical cells; fumose hyaline in apical cells. Abdomen: yellow beneath, light yellow above.

Male genitalia.—Male pygofer: posterior margin produced dorsocaudad in a broadly-rounded lobe nearly as broad as long, posterior pygofer hooks directed dorsocaudad; mesal hooks longer than posterior, directed dorsad. Aedeagus in lateral aspect with posterior margin sinuate, tapering from broad base to slight constriction at outer fourth of shaft. Single pair of slender apical processes crossed near base, slightly exceeding half the length of shaft. Style and connective as in *E. furcata*.

Material studied.—One female, Oregon, Illinois, June 19 '17, determined by W. L. McAtee as *Eupteryx flavoscuta* var. *clavalis*; six females and sixteen males, Long Lake, New York, July 1946, R. H. and L. D. Beamer; one male and one female, Chimneys C. G. Gt. Smoky Mt. N.P. Sept. 1, 1948, Ross and Stannard; five males and seven females, Rocky Sp. Gap, Gt. Smoky Mt. N.P., September 1, 1948. Records of specimens in the Herbert Osborn Collection of the Ohio State University are as follows: Hocking Co., Ohio September 1932, 1933, D. M. Johnson; Hocking Co., Ohio, July 1945, Lake Co., Ohio, September 1928; Scioto Co., Ohio, June 1945; Fairfield Co., Ohio, July 1945, D. J. & J. N. Knull. Collected from ferns.

Eupteryx flavoscuta Gillette

(Fig. 3 A, B, C.)

Eupteryx flavoscuta Gillette, 1898, Proc. U. S. Nat. Mus., 20 (1138): 749-750.

Typhlocyba flavoscuta, Barber, 1914, Bull. American Mus. Nat. Hist., 33: 535.

Eupteryx flavoscuta var. *flavoscuta*, McAtee, 1919, Ent. News, 30 (7): 185.

Cicadella flavoscuta, Oman, 1949, Mem. Ent. Soc. Washington, 3: 89.

Eupteryx flavoscuta, Young, 1952, Bull. Univ. Kansas Sci. Bull., 35 (I, 1): 96.

Resembling *Eupteryx clavalis* McAtee in color but with markings more extensive, also resembling *Eupteryx nigra* Osborn but with scutellum and often with disc of pronotum yellow; also similar to

these species in shape of male pygofer but easily distinguished from them by having the mesal hook only half as long as posterior hook.

Length.—3.5-4.0 mm.

Color.—Head: face and vertex bright yellow, crown dark brown; Thorax: yellow beneath, pronotum usually dark chocolate brown sometimes with disc yellow or yellowish brown; scutellum yellow with lateral angles dark brown. Fore wing: dark chocolate brown with median third of clavus greenish yellow and a broad yellow stripe along costal margin from base of wing to cross vein. Abdomen: yellow beneath, dark brown above, finely bordered with yellow on segmental margins.

Male genitalia.—Male pygofer: posterior margin greatly produced into an acutely rounded lobe about one third as broad as long, posterior pair of pygofer hooks directed dorsocaudad, mesal pair half as long as posterior pair, gradually curving dorsomesad. Aedeagus in lateral aspect with posterior margin gradually curving dorsad; shaft gradually tapering from base to apex, a single pair of slender apical processes crossing near base, slightly less than half the length of shaft. Style and connective as in *E. furcata*.

Material studied.—Sixty-five females, and sixty-one males from the following locations: Pinks Lake, Hull, Quebec, Canada, August 27, 1931; Newaygo, Canada, July 30, 1929; Benton, New Hampshire, August 21, 1934; New Haverhill, New Hampshire, August 21, 1934; Morris, Wisconsin, August 27, 1937; New Haven, Connecticut, August 23, 1934; Wilmington, New York, June 30, 1922; Long Lake, New York, July 28, 1946; Heart Lake, New York, July 27, 1946; Blue Mt. Lake, New York, July 27, 1946; Otter Lake, New York, July 25, 1946; Saranac Inn, New York, July 28, 1946; Ashton, Maryland, August 13, 1938; Glen Echo, Maryland, August 8, 28, 22, 1921, May 14, 1922; Chain Bridge, Virginia, September 11, 18, 1921; Washington, D. C., October 2, 1932, on *Pteris aquilina*; Herod, Illinois, July 8-11, 1935; Castle Rock, Oregon, Illinois, June 30, 1935; Savanna, Illinois, June 13, 1917; Jonesboro, Illinois, May 19, 1932. Records of specimens in the Herbert Osborn Collection of the Ohio State University are as follows: Orono, Maine, August 5, 17, 1913, July 10, 1914; Cape Cottage, Maine, September 4, 1913; Cranberry Lake, New York, July 24, 25, 30, 1920; Wanakena, New York, July 29, 1920; Bear Mt., Vermont; Chevy Chase, Maryland, June 5, 1905, on fern; Hocking Co., Ohio, October 23, 1932; Cantwell Cliffs, Ohio, September 17, 1933.

Eupteryx nigra Osborn

(Fig. 4 A, B, C.)

Eupteryx nigra Osborn, 1905, Bull. New York State Mus., 97: 543.

Eupteryx flavoscuta var. *nigra*, McAtee, 1919, Ent. News, 30 (7): 184-5.

Eupteryx flavoscuta var. *juvenis* McAtee, 1919, Ent. News, 30 (7): 186. (*new synonymy*)

Eupteryx nigra, Osborn, 1928, Ohio Biol. Surv., 14: 352.

Cicadella juvenis (McAtee), Oman, 1949, Mem. Ent. Soc. Washington, 3: 89.

Cicadella nigra (Osborn), Oman, 1949, Mem. Ent. Soc. Washington, 3: 89.
Eupteryx nigra, Young, 1952, Bull. Univ. Kansas Sci. Bull., 35 (I, 1): 96.
Eupteryx juvenis, Young, 1952, Bull. Univ. Kansas Sci. Bull., 35 (I, 1): 96.

Resembling the dark form of *Eupteryx vanduzeei* Gillette in color but distinguished by having entire face and venter of thorax bright yellow rather than brown, and by having mesal hook of male pygofer greatly reduced.

Length.—3.75-4.0 mm.

Color.—Head: vertex and face bright yellow; crown between eyes light to dark brown. Thorax: yellow beneath; pronotum and scutellum uniform deep blackish brown. Fore wing: deep blackish brown with yellow longitudinal stripe along costal margin extending nearly to cross veins. Abdomen: dirty yellow beneath, dark brown above with margins of segments narrowly margined with yellow. Teneral specimens (described as *juvenis*) with two red longitudinal lines on either side of midline on crown of head, pronotum with a median red line extending from anterior to posterior margins and with red markings on lateral fourth of pronotum behind eye. This red color is concealed by the dark brown pigmentation in fully matured specimens.

Male genitalia.—Male pygofer: posterior margin greatly produced into an apically rounded lobe about two thirds as long as broad; posterior hook directed dorsocaudad; mesal hook greatly reduced or lacking; membranous portion of pygofer extended almost to apex of posterior hook. Aedeagus in lateral aspect evenly rounded on posterior margin from base to apex, of nearly uniform width, single pair of apical processes widely diverging, not crossing at base. Style and connective as in *E. furcata*.

Material studied.—Newaygo, Canada, July 30, 1929; Fryeburg, Maine, August 20, 1934; Benton, New Hampshire, August 21, 1934; New Haverhill, New Hampshire, August 21, 1934; Springfield, Vermont, August 22, 1934; Greenfield, Massachusetts, August 22, 1934; New Haven, Connecticut, August 20, 1934; Storrs, Connecticut, August 3, 1946; Conesus Lake, New York, June 22, 1916; Larabee, Pennsylvania, August 24, 1934; Ashton, Maryland, August 13, 1938; Beltsville, Maryland, May 21, 1922; Glen Echo, Maryland, May 14, 1922, May 16, 1923, June 18, 1922, August 8, 28, 1921, August 22, 1922; Plummer's Island, Maryland, July 22, 1943; 11 miles N. NE Washington D. C., October 2, 1932; Dismal Swamp, Virginia, August 13, 1934; Lake Drummond, Virginia, September 10, 1933, Vienna, Virginia, May 30, 1932; Batesburg, South Carolina, August 24, 1930; Lexington, South Carolina, August 24, 1930; Rocky Spring Gap, Great Smoky Mts., September 1, 1948; Mineral Spring, Indiana, June 24, 1916; Antioch, Illinois, August 24, 1935; Dubois, Illinois, May 22, 1917; Vienna, Illinois, June 14, 1934; Volo, Illinois, August 24, 1935. Records for the specimens in the Herbert Osborn Collection of the Ohio State University are as follows: Holotype female, Jamaica (New York), August 20, 1904; Paratype female Columbus, Ohio, September 15, 1933; Bar Harbor, Maine, August 31, 1913; Orono,

Maine, August 1, 31, 1913; Little Mt., Lake Co., Ohio, September 18, 1928; Hocking Co., Ohio, July 26, 1945, August 16, 1945, September 14, 1945; Madison Co., Ohio July 28, 1945.

Dr. Josef N. Knull has examined the holotype and paratype females and states that they are entirely pale beneath, and not dark as is the black form of *Eupteryx vanduzei* Gillette which has been confused with this species in the past.

Eupteryx omani n. sp.

(Fig. 5 A, B, C.)

Resembling *Eupteryx nigra* in shade and distribution of color, but easily recognized by its smaller size and male genitalia.

Length.—3.0-3.25 mm.

Color.—Head: vertex and face bright yellow; crown between eyes light to dark brown. Thorax yellow beneath; pronotum and scutellum uniform deep blackish brown. Fore wing: deep blackish brown with outer basal cell along costal margin white to pale yellow to cross vein. Abdomen: yellow beneath, brown above.

Male genitalia.—Male pygofer: posterior margin produced as a strong acute heavily sclerotized hook; dorsal membranous portion of pygofer extending only to middle of hook; mesal hooks lacking. Aedeagus: in lateral aspect with shaft thickened on basal third, apical two thirds reduced, slender, nearly straight. Single pair of apical processes short, less than one fourth length of shaft, directed laterad, not crossing. Styles and connective as in *E. furcata*. Plates with five macro-setae forming an irregular lateral row.

Types.—Holotype male, allotype female and three female paratypes, Sanford, Florida, July 22, 1939, P. W. Oman, in the U. S. National Museum Collection. One male and three female paratypes, Gainesville, Florida, June 9, 1918, C. J. Drake (male slide No. E-3-6) and one male paratype, Oviedo, Florida, November 2, 1927, H. Osborn, Slide No. E-3-9. In the collection of Mrs. J. N. Knull, Columbus, Ohio. One male and thirty-one female paratypes, Gold Head Branch State Park, Clay County, Florida, December 10, 1955, F. W. Mead; two male and thirty-two female paratypes, same locality, January 14, 1956, F. W. Mead, collected on *Dryopteris ludoviciana* (Kunze). In the collections of the State Plant Board of Florida, and the University of Louisville.

It is with great pleasure that the author names this species in honor of Dr. Paul W. Oman who has made valuable contributions to our knowledge of North American leafhoppers.

Eupteryx vanduzei Gillette

(Fig. 6 A, B, C.)

Eupteryx vanduzei Gillette, 1898, Proc. United States Nat. Mus., 20 (1138): 748-9.

Typhlocyba vanduzei, Van Duzee, 1917, Univ. California Tech. Bull. Ent., 2: 707.

Eupteryx vanduzei, McAtee, 1919, Ent. News, 30 (7): 184.

Cicadella vanduzei, Oman, 1949, Mem. Ent. Soc. Washington, 3: 89.

Eupteryx vanduzei, Young, 1952, Bull. Univ. Kansas Sci. Bull., 35 (I, 1): 96.

Dark form resembling *Eupteryx nigra* Osborn, but easily distinguished by having ventral half of face and venter of thorax dark brown. Male genitalia sharply distinct as indicated below.

Length.—3.5-4.0 mm.

Color.—Head: vertex and portion of face between eyes light yellow to white; crown black; face with light band on upper half, fuscous below. Thorax: fuscous beneath; pronotum uniformly black throughout; scutellum uniform black. Fore wing: color variable, uniformly black in some specimens, uniformly chalky white with costal vein yellow in typical specimens; other specimens white with varying amounts of black forming an elongate elliptical spot in the middle of each wing bordered broadly with chalky white, apical cells and apices of basal cells fuscous to black. Abdomen: yellow beneath; yellow above on white winged specimens; fuscous to black on black-winged specimens.

Prior to this study of *vanduzei* it had been suggested by Young (1952, p. 96) and by Beamer (in litt.) that only males of this species might exist. In an effort to solve this problem the author brought together specimens bearing the same collection data as found on typical specimens of *vanduzei* on hand. When this was done it was found that certain specimens looking much like *E. nigra* were usually collected at the same time as typical *vanduzei* specimens. On examination of the male genitalia of these specimens and comparison with the genitalia of other specimens also determined as *E. nigra* it was found that two sharply distinct kinds of genitalia existed in specimens determined as *E. nigra*. A comparison of color markings showed a marked similarity between typical *vanduzei* specimens and the *nigra*-like specimens collected with them, in all respects except the fore wing and dorsum of the abdomen. From these observations the author concludes that this species is one in which the color of the fore wing varies in at least the female and possibly the male although no white winged males have been seen yet. Dark-winged females have been seen as well as a number of intergrades between white and black which have a large black spot in the center of a white wing. The nature of the color distribution does not seem to be a matter of degree of maturity as far as can be observed from preserved speci-

mens, since white-winged specimens are as intensely black in all other regions as are black-winged specimens, and do not appear to be in any way teneral.

Male genitalia.—Male pygofer: posterior margin produced in an acute moderately sclerotized lobe; mesal and posterior hooks well developed; of nearly equal length; posterior hooks directed caudad, free from membrane throughout most of their length, mesal pair strongly curving dorsocaudad; apices acute. Aedeagus: in lateral aspect straight, nearly uniform thickness from base to apex; single pair of apical processes directed ventrad parallel to sides of shaft, exceeding half length of shaft.

Types.—Holotype female of Gillette in United States National Museum Collection. Neallotype male, here designated, Saranac Inn, New York, July 28, 1946, R. H. Beamer, in the Snow Entomological Collections of the University of Kansas.

Material studied.—Eighty-two typical females, eleven dark-winged females and five dark-winged males, Saranac Inn, New York, July 28, 1946, R. H. Beamer; eleven typical females and three dark males, Long Lake, New York, July 28, 1946, R. H. Beamer; nine typical females, Center Harbor, New Hampshire, July 1951, P. B. Lawson. Records of specimens in the Herbert Osborn Collection of the Ohio State University are as follows: Wanakena, New York, five typical females, August 1-7, 1917, C. J. Drake; two typical females, July 29, 1920, H. Osborn; one typical female and ten dark-winged specimens of both sexes, July 29, 1920, C. J. Drake. One typical female, Great Smoky Mt. National Park, June 21, 1942, D. J. & J. N. Knull, in the collection of Mrs. J. N. Knull, Columbus, Ohio.

Eupteryx melissae Curtis

(Fig. 7 A, B, C.)

Eupteryx melissae Curtis, 1837, British Ent., 14 (640): 2.

Typhlocyba collina Flor, 1861, Arch. Nat. Kurklands, (2) 4: 433.

Eupteryx quinquemaculata Baker, 1903, Invert. Pacif., 1: 8.

Cicadella melissae, Oman, 1949, Mem. Ent. Soc. Washington, 3: 89.

Eupteryx melissae, Young, 1952, Bull. Univ. Kansas Sci. Bull., 35 (I, 1): 96.

Resembling *Eupteryx aurata* (Linnaeus) in the presence of distinct spots on head and pronotum but easily distinguished by having five distinct black spots on head and four to six brownish black spots on pronotum, male genitalia with aedeagus bearing short only slightly curved apical processes.

Length.—2.75-3.5 mm.

Color.—Head: face, vertex, and crown light yellow with five round black spots, two above, two beneath vertex and one medial on posterior margin of head, lateral margins of clypeus light brown. Thorax: yellow to dark brown beneath; pronotum yellowish white with four to six small brown spots, two

at anterior margin near inner margins of eyes, others forming a transverse median line separated by a pale brown inverted V-shaped mark on disc which forms with the anterior two spots a pale X. Scutellum yellow with a small black spot just inside each lateral angle and sometimes with a smaller pair of black spots on disc. Fore wing: white to yellowish white veins white margined with greenish brown markings which form a basal, apical, and median spot on each clavus, and an indistinct band across the basal and apical third of the basal cells, and border the longitudinal and apical veins and outer margin of the second and third apical cells. Abdomen: segments dark yellowish brown margined with yellow along membranes and lateral margins.

Male genitalia.—Male pygofer: posterior margin evenly rounded, not produced; a single short acute hook on mesal margin of dorsal posterior angle directed cephalomesad. Aedeagus elongate, slender, gradually tapering to apex, with single apical pair of processes directed ventrad, crossing at outer fourth caudad of shaft, less than half as long as shaft. Style and connective characteristic of the genus. Plate tapering to acutely rounded apex, with a single macroseta near basal attachment.

Determination of this species is based on figures and description of this species by Ribaut (1936), and on two male specimens collected by Horvath, and determined as *melissae* by him.

Material studied.—Over two hundred specimens of both sexes have been seen, collected in the following localities: Fonthill, Ontario, Canada, on catnip, September 18, 27, 1949; Vineland, Ontario, September 15, 1942; Great Brewster, Massachusetts, October 27, 1919, M. D. Leonard, G. W. Barber; St. Thomas, Pennsylvania, April 30, 1932, J. O. Pepper, on horehound; North East, Pennsylvania, October 4, 1912, F. Johnson; Hagerstown, Maryland; Plimmers Island, Maryland, June 29, 1913, W. L. McAtee; Washington, D. C. June 21, 1913 A. B. Duckett, on hollyhock, Arlington, Virginia, May 1921, Chittenden No. 6850, on sage; May 26, 1932 P. W. Oman; Victoria, British Columbia, Canada, September 6, 1926, W. Downes, host *Salvia officinalis*; Cliffdell, Washington, July 7, 1935, P. W. Oman; Free-water, Oregon, June 15, 1948, Davis, Black, & Hammons; Riverdale, Idaho, August 12, 1934, C. F. Smith; Nevada March 36, C. L. Brown; Logan, Utah, June 9, 1938, G. F. Knowlton; Bountiful, Utah, June 15, 1945, L. S. Jones; Pleasant Grove, Utah, July 17, 1935, G. F. Knowlton & W. M. Allen; Monterey, California, July 22, 1935, R. H. Beamer; Sargent, California, July 22, 1935, R. H. Beamer; Santa Barbara, California, July 1925; Oak Glen, California, May 18, 1940, Christenson; Yucaipa, California, July 7, 1938, Christenson; Two males determined "*Eupteryx melissae*" by G. Horvath, labeled "Gyeke, Horvath." Additional records from the Herbert Osborn Collection of the Ohio State University are as follows: Put-in-Bay, Ohio, September 18, 1945, D. J. & J. N. Knoll; Floral Park, New Jersey, 5, 15; Inner Brewster Island, Massachusetts, October 27, 1919, M. D. Leonard, R. W. Barber; Richfield, Pennsylvania, July 26, 1918, J. G. Sanders; Experiment Station, June 4, 1897 (probably Ames, Iowa).

Eupteryx aurata (Linnaeus)

(Fig. 8 A, B, C.)

Cicada aurata Linnaeus, 1758, *Systema Naturae*, 10: 439.*Typhlocyba picta* Burmeister, 1835, *Handbuch der Ent.*, 2 (1): 107.*Typhlocyba aurata*, Herrech-Schaffer, 1835, *Nomenclator Ent.*, 1: 68.*Typhlocyba fulva* Herrech-Schaffer, 1836, *Deutschlands Ins.*, 143: 1.*Eupteryx aurata*, Oshanin, 1907, *Ann. Mus. Zool. St. Petersburg*, 12: 204.

Resembling *Eupteryx melissae* Curtis in the presence of spots on the head and pronotum, but easily distinguished by having only three spots on the head and three spots on the pronotum, male genitalia with aedeagus having apical processes nearly as long as shaft, strongly curving cephalodorsad forming almost a complete circle in lateral aspect.

Length.—3.5 mm.

Color.—Head: face, vertex and crown bright yellow with dark brown color on genae along clypeus and clypellus; two large dark brown spots between eyes on crown usually separated from each other and from each eye by yellow ground color, rarely confluent medially. Thorax: venter dark brown; pronotum bright yellow with dark brown markings, one medial on anterior margin and two posteriorly-rounded spots one behind each eye extending from anterior margin caudad and slightly mesad to posterior third of pronotum. Scutellum with basal half dark brown, sometimes with a median yellow and lateral yellow marginal lines joining yellow posterior third. Fore wing: white to yellowish hyaline, with dark brown longitudinal zigzag lines extending from base of scutellum to apex of wing, touching commissural margin at base, middle and apex of clavus and costal margin at basal and apical thirds of outer basal cell. Abdomen: dark brown to black with segments finely margined with yellow.

Male genitalia.—Pygofer: posterior margin rounded, slightly truncate on dorsal caudal angle; hooks arising from inrolled mesal margin, completely concealed in lateral view; posterior hook directed dorsad on basal half, sharply curved caudad on apical half; anterior hook straight, directed dorsocephalad mesally. Aedeagus: in lateral aspect gradually tapering from broad base to apex; single pair of apical processes nearly as long as shaft but curving sharply dorsocephalad and crossing near apices cephalic to shaft. Styles and connective as in other species of genus. Male plate with one macroseta lateral near base.

Material studied.—Eighteen males and twenty-three females, Bar Harbor, Maine, August 23, 1934, A. E. Brower; eight specimens including both sexes, Ottawa, Ontario, Canada, August 3, 5, 6, 12, and September 14, 20, 1942, G. S. Walley, on hollyhocks, one on burdock. Determination of this species is based on descriptions and figures by Ribaut (1936).

Eupteryx artemisiae (Kirschbaum)

Typhlocyba artemisiae Kirschbaum, 1868, Jahrb. Ver. Nat. Nassau., 21-22:

This introduced species does not resemble any of the other North American species and is easily distinguished by its apparent lack of brown or black color markings.

Length.—3.0 mm.

Color.—Head, pronotum, scutellum and abdomen pale greenish yellow; fore wings greenish yellow, inner two basal cells semihyaline, faint brown spots and lines along longitudinal and cross veins and bordering veins forming apical cells.

This species was first reported as occurring in North America by McAtee (1925) from a single specimen swept from *Artemisia* spp. in the Arnold Arboretum, Boston, Massachusetts, July 27, 1921, by Harold Morrison. The above description was made from this specimen in the United States National Museum. No other specimens of this species are known to have been taken since then in North America.

ACKNOWLEDGMENTS

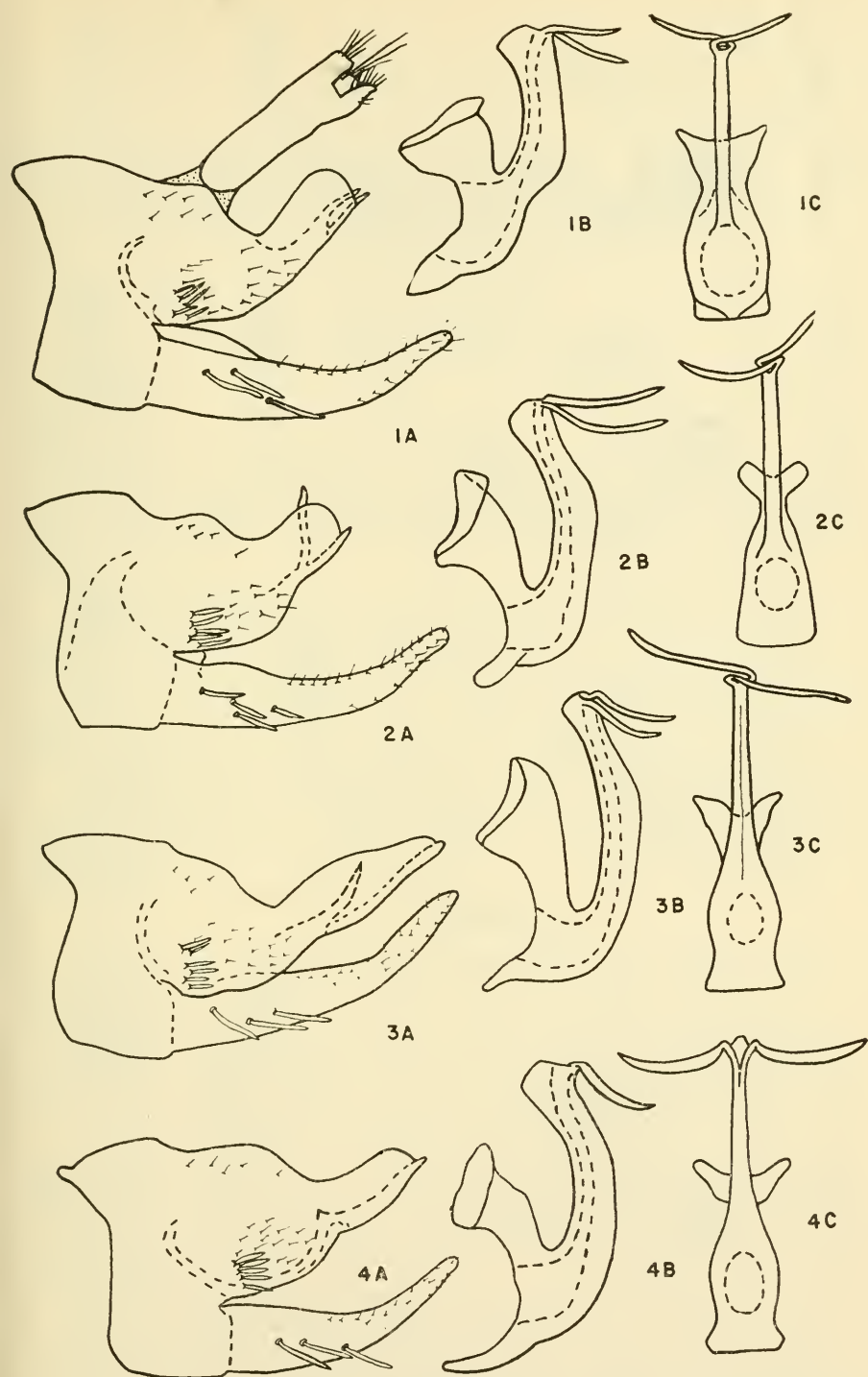
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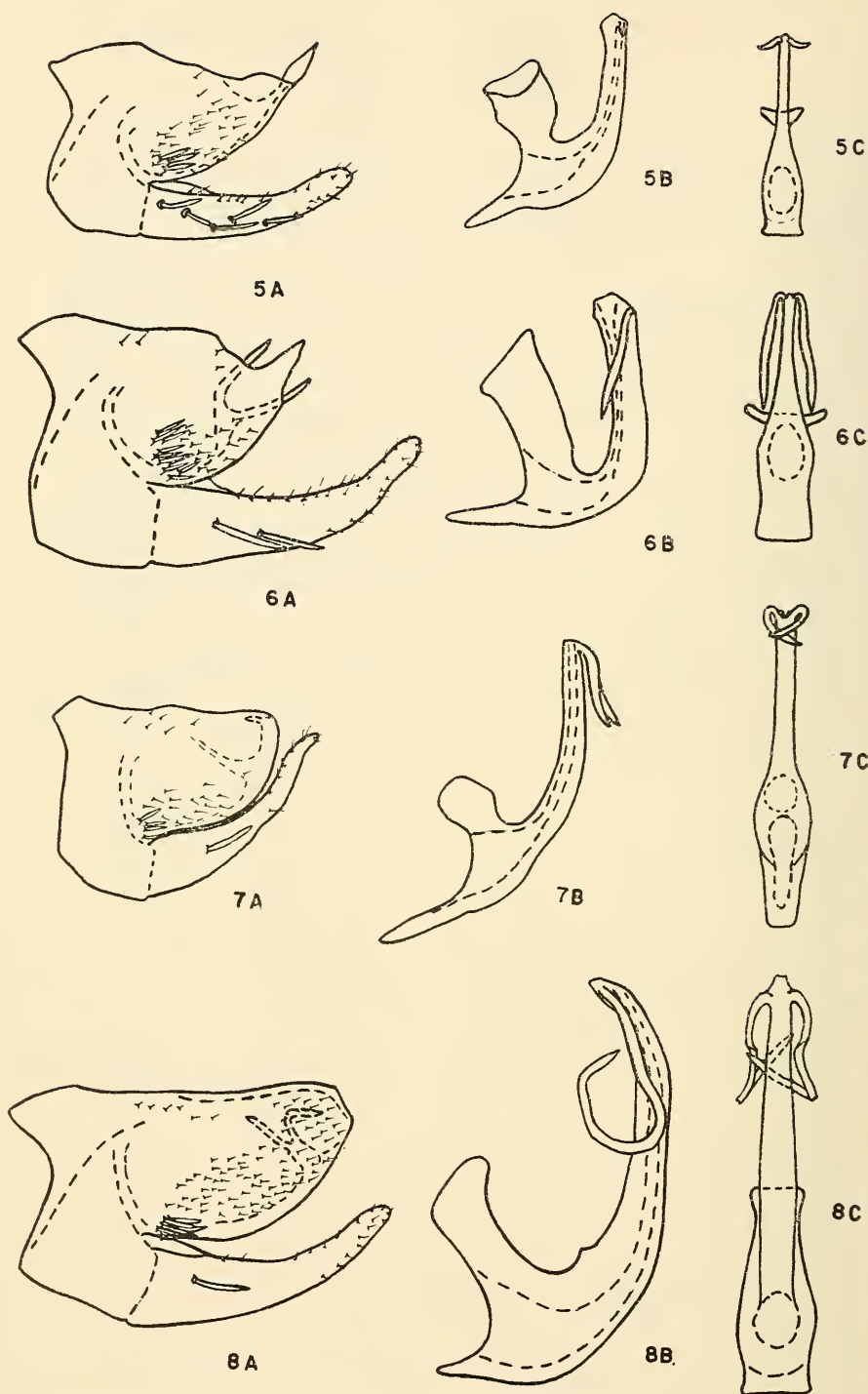
FIGS. 1-4. Male genitalia of *Eupteryx* spp. A. Left side of pygofer. B. Left side of aedeagus. C. Posterior aspect of aedeagus.

FIG. 1. *Eupteryx furcata* (Beamer).

FIG. 3. *Eupteryx flavoseuta* Gillette.

FIG. 2. *Eupteryx clavalis* McAtee.

FIG. 4. *Eupteryx nigra* Osborn.



FIGS. 5-8. Male genitalia of *Eupteryx* spp. A. Left side of pygofer. B. Left side of aedeagus. C. Posterior aspect of aedeagus.

FIG. 5. *Eupteryx omani* n. sp.

FIG. 7. *Eupteryx melissae* Curtis.

FIG. 6. *Eupteryx vanduzeei* Gillette.

FIG. 8. *Eupteryx aurata* (Linnaeus).